AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): A method of materials processing, wherein the method comprises applying bursts of laser light to a target area of a material at a predetermined repetition rate, the burst of laser light comprising at least first and second pulses of laser light displaced in time, wherein the first pulse has a first pulse width and the second pulse has a second pulse width, and the first pulse width is greater than the second pulse width, the second pulse width being in the picosecond range or shorter.

2. (original): The method as claimed in claim 1, wherein the first pulse width and the second pulse width are less than a time separation between the first and second pulses.

3. (original): The method as claimed in claim 1, wherein the first and second pulse widths are measured at the full width, half-maximum power levels of the first and second pulses, respectively.

4. (original): The method as claimed in claim 1, wherein the first pulse has a first pulse energy and the second pulse has a second pulse energy, and the first pulse energy is substantially equal to the second pulse energy.

5. (original): The method as claimed in claim 1, wherein the first pulse has a first pulse energy and the second pulse has a second pulse energy, and the first pulse energy is not equal to the second pulse energy.

6. (original): The method as claimed in claim 1, wherein the first pulse has a first polarization vector and the second pulse has a second polarization vector, wherein the first polarization vector is not equal to the second polarization vector.

7. (original): The method as claimed in claim 1, wherein the first pulse has a first wavelength and the second pulse has a second wavelength, wherein the first wavelength is not equal to the second wavelength.

8. (original): The method as claimed in claim 1, wherein the predetermined repetition rate is substantially equal to or greater than 100 kilohertz.

9. (original): The method as claimed in claim 1, wherein the first pulse has an envelope shape, wherein the first pulse is an aggregation of a plurality of pulses that form the envelope shape.

10. (original): The method as claimed in claim 1, wherein the second pulse has an envelope shape, wherein the second pulse is an aggregation of a plurality of pulses that form the envelope shape.

11. (original): The method as claimed in claim 1, wherein at one pulse further comprises a pedestal having sufficient energy to thermally heat the target area of the material.

12. (original): A method of materials processing, wherein the method comprises applying bursts of laser light to a target area of a material at a predetermined repetition rate, the burst of laser light comprising at least first and second pulses of laser light overlapped in time, wherein the first pulse has a first pulse width and the second pulse has a second pulse width, and

the first pulse width is greater than the second pulse width<u>, the second pulse width being in the picosecond range or shorter</u>.

13. (original): The method as claimed in claim 12, wherein the first and second pulse widths are measured at the full width, half-maximum power levels of the first and second pulses, respectively.

14. (original): The method as claimed in claim 12, wherein the first pulse has a first pulse energy and the second pulse has a second pulse energy, and the first pulse energy is substantially equal to the second pulse energy.

15. (original): The method as claimed in claim 12, wherein the first pulse has a first pulse energy and the second pulse has a second pulse energy, and the first pulse energy is not equal to the second pulse energy.

16. (original): The method as claimed in claim 12, wherein the first pulse has a first polarization vector and the second pulse has a second polarization vector, wherein the first polarization vector is not equal to the second polarization vector.

17. (original): The method as claimed in claim 12, wherein the first pulse has a first wavelength and the second pulse has a second wavelength, wherein the first wavelength is not equal to the second wavelength.

18. (original): The method as claimed in claim 12, wherein the predetermined repetition rate is substantially equal to or greater than 100 kilohertz.

19. (original): The method as claimed in claim 12, wherein the first pulse has an envelope shape, wherein the first pulse is an aggregation of a plurality of pulses that form the envelope shape.

20. (original): The method as claimed in claim 12, wherein the second pulse has an envelope shape, wherein the second pulse is an aggregation of a plurality of pulses that form the envelope shape.

21. (original): The method as claimed in claim 12, wherein at one pulse further comprises a pedestal having sufficient energy to thermally heat the target area of the material.

22. (original): A method of materials processing, wherein the method comprises applying bursts of laser light to a target area of a material at a predetermined repetition rate, the burst of laser light comprising at least first and second pulses of laser light displaced in time, wherein the first pulse has a first pulse width and the second pulse has a second pulse width, wherein predetermined parameters of the first pulse are selected to induce a change in a selected property of the material, and predetermined parameters of the second pulse are selected based upon the property change induced by the first pulse.

23. (original): The method as claimed in claim 22, wherein the predetermined repetition rate is substantially equal to or greater than 100 kilohertz.

24. (original): The method as claimed in claim 22, wherein the predetermined parameters of the first pulse comprise pulse width, pulse energy, pulse wavelength and pulse polarization vector and the predetermined parameters of the second pulse comprise pulse width, pulse energy, pulse wavelength and pulse polarization vector.

25. (original): The method as claimed in claim 24, wherein the pulse energy of the first pulse is substantially equal to the pulse energy of the second pulse.

26. (original): The method as claimed in claim 24, wherein the pulse energy of the first pulse is not equal to the pulse energy of the second pulse.

27. (original): The method as claimed in claim 24, wherein the pulse wavelength of the first pulse is not equal to the pulse wavelength of the second pulse.

28. (original): The method as claimed in claim 24, wherein the pulse polarization of the first pulse is not equal to the pulse polarization of the second pulse.

29. (original): The method as claimed in claim 22, wherein the first pulse changes electronic properties of the processed material.

30. (original): The method as claimed in claim 22, wherein the first pulse changes structural properties of the processed material.

31. (original): The method as claimed in claim 22, wherein the first pulse creates a heat affected zone in the processed material and the second pulse ablates the heat affected zone.

32. (original): The method as claimed in claim 22, wherein the first pulse has an envelope shape, wherein the first pulse is an aggregation of a plurality of pulses that form the envelope shape.

33. (original): The method as claimed in claim 22, wherein the second pulse has an envelope shape, wherein the second pulse is an aggregation of a plurality of pulses that form the envelope shape.

34. (original): The method as claimed in claim 22, wherein at one pulse further comprises a pedestal having sufficient energy to thermally heat the target area of the material.

35. (original): A method of materials processing, wherein the method comprises applying bursts of laser light to a target area of a material at a predetermined repetition rate, the burst of laser light comprising at least first and second pulses of laser light overlapped in time, wherein the first pulse has a first pulse width and the second pulse has a second pulse width, wherein predetermined parameters of the first pulse are selected to induce a change in a selected property of the material, and predetermined parameters of the second pulse are selected based upon the property change induced by the first pulse.

36. (original): The method as claimed in claim 34, wherein the first pulse creates a heat affected zone in the processed material and the second pulse ablates the heat affected zone.

37. (original): The method as claimed in claim 35, wherein the predetermined repetition rate is substantially equal to or greater than 100 kilohertz.

38. (original): The method as claimed in claim 35, wherein the predetermined parameters of the first pulse comprise pulse width, pulse energy, pulse wavelength and pulse polarization vector and the predetermined parameters of the second pulse comprise pulse width, pulse energy, pulse wavelength and pulse polarization vector.

39. (original): The method as claimed in claim 38, wherein the pulse energy of the first pulse is substantially equal to the pulse energy of the second pulse.

40. (original): The method as claimed in claim 38, wherein the pulse energy of the first pulse is not equal to the pulse energy of the second pulse.

41. (original): The method as claimed in claim 38, wherein the pulse wavelength of the first pulse is not equal to the pulse wavelength of the second pulse.

42. (original): The method as claimed in claim 38, wherein the pulse polarization of the first pulse is not equal to the pulse polarization of the second pulse.

43. (original): The method as claimed in claim 35, wherein the first pulse changes electronic properties of the processed material.

44. (original): The method as claimed in claim 35, wherein the first pulse changes structural properties of the processed material.

45. (original): The method as claimed in claim 35, wherein the first pulse has an envelope shape, wherein the first pulse is an aggregation of a plurality of pulses that form the envelope shape.

46. (original): The method as claimed in claim 35, wherein the second pulse has an envelope shape, wherein the second pulse is an aggregation of a plurality of pulses that form the envelope shape.

47. (original): The method as claimed in claim 35, wherein at one pulse further comprises a pedestal having sufficient energy to thermally heat the target area of the material.

48. (original): A laser apparatus for materials processing, wherein the laser applies bursts of laser light to a target area of a material at a predetermined repetition rate, the burst of laser light comprising at least first and second pulses of laser light displaced in time, wherein the first pulse emitted by the laser apparatus has a first pulse width and the second pulse emitted by

the laser apparatus has a second pulse width, and the first pulse width is greater than the second pulse width, the second pulse width being in the picosecond range or shorter.

49. (original): The laser apparatus as claimed in claim 48, wherein the first pulse emitted by the laser apparatus has a first pulse energy and the second pulse emitted by the laser apparatus has a second pulse energy, and the first pulse energy is substantially equal to the second pulse energy.

50. (original): The laser apparatus as claimed in claim 48, wherein the first pulse emitted by the laser apparatus has a first pulse energy and the second pulse emitted by the laser apparatus has a second pulse energy, and the first pulse energy is not equal to the second pulse energy.

51. (original): The laser apparatus as claimed in claim 48, wherein the first pulse emitted by the laser apparatus has a first polarization vector and the second pulse emitted by the laser apparatus has a second polarization vector, wherein the first polarization vector is not equal to the second polarization vector.

52. (original): The laser apparatus as claimed in claim 48, wherein the first pulse emitted by the laser apparatus has a first wavelength and the second pulse emitted by the laser apparatus has a second wavelength, wherein the first wavelength is not equal to the second wavelength.

53. (original): The laser apparatus as claimed in claim 48, wherein the predetermined repetition rate is substantially equal to or greater than 100 kilohertz.

54. (original): The laser apparatus as claimed in claim 48, wherein the first pulse has an envelope shape, wherein the first pulse is an aggregation of a plurality of pulses that form the envelope shape.

55. (original): The laser apparatus as claimed in claim 48, wherein the second pulse has an envelope shape, wherein the second pulse is an aggregation of a plurality of pulses that form the envelope shape.

56. (original): The laser apparatus as claimed in claim 48, wherein at one pulse further comprises a pedestal having sufficient energy to thermally heat the target area of the material.

57. (original): A laser apparatus of materials processing, wherein the laser apparatus applies bursts of laser light to a target area of a material at a predetermined repetition rate, the burst of laser light comprising at least first and second pulses of laser light overlapped in time, wherein the first pulse emitted by the laser apparatus has a first pulse width and the second pulse emitted by the laser apparatus has a second pulse width, and the first pulse width is greater than the second pulse width, the second pulse width being in the picosecond range or shorter.

58. (original): The laser apparatus as claimed in claim 57, wherein the first pulse emitted by the laser apparatus has a first pulse energy and the second pulse emitted by the laser apparatus has a second pulse energy, and the first pulse energy is substantially equal to the second pulse energy.

59. (original): The laser apparatus as claimed in claim 57, wherein the first pulse emitted by the laser apparatus has a first pulse energy and the second pulse emitted by the laser

apparatus has a second pulse energy, and the first pulse energy is not equal to the second pulse energy.

60. (original): The laser apparatus as claimed in claim 57, wherein the first pulse emitted by the laser apparatus has a first polarization vector and the second pulse emitted by the laser apparatus has a second polarization vector, wherein the first polarization vector is not equal to the second polarization vector.

61. (original): The laser apparatus as claimed in claim 57, wherein the first pulse emitted by the laser apparatus has a first wavelength and the second pulse emitted by the laser apparatus has a second wavelength, wherein the first wavelength is not equal to the second wavelength.

62. (original): The laser apparatus as claimed in claim 57, wherein the predetermined repetition rate is substantially equal to or greater than 100 kilohertz.

63. (original): The laser apparatus as claimed in claim 57, wherein the first pulse has an envelope shape, wherein the first pulse is an aggregation of a plurality of pulses that form the envelope shape.

64. (original): The laser apparatus as claimed in claim 57, wherein the second pulse has an envelope shape, wherein the second pulse is an aggregation of a plurality of pulses that form the envelope shape.

65. (original): The laser apparatus as claimed in claim 57, wherein at one pulse further comprises a pedestal having sufficient energy to thermally heat the target area of the material.

66. (original): A laser apparatus for materials processing, wherein the laser apparatus applies bursts of laser light to a target area of a material at a predetermined repetition rate, the burst of laser light comprising at least first and second pulses of laser light displaced in time, wherein the first pulse emitted by the laser apparatus has a first pulse width and the second pulse emitted by the laser apparatus has a second pulse width, and wherein predetermined parameters of the first pulse induce a change in a selected property of the material, and predetermined parameters of the second pulse interact with the property change induced by the first pulse.

67. (original): The laser apparatus as claimed in claim 66, wherein the predetermined repetition rate is substantially equal to or greater than 100 kilohertz.

68. (original): The laser apparatus as claimed in claim 66, wherein the predetermined parameters of the first pulse comprise pulse width, pulse energy, pulse wavelength and pulse polarization vector and the predetermined parameters of the second pulse comprise pulse width, pulse energy, pulse wavelength and pulse polarization vector.

69. (original): The laser apparatus as claimed in claim 66, wherein the first pulse changes electronic properties of the processed material.

70. (original): The laser apparatus as claimed in claim 66, wherein the first pulse changes structural properties of the processed material.

71. (original): The laser apparatus as claimed in claim 66, wherein the first pulse creates a heat affected zone in the processed material and the second pulse ablates the heat affected zone.

72. (original): The laser apparatus as claimed in claim 66, wherein the first pulse has an envelope shape, wherein the first pulse is an aggregation of a plurality of pulses that form the envelope shape.

73. (original): The laser apparatus as claimed in claim 66, wherein the second pulse has an envelope shape, wherein the second pulse is an aggregation of a plurality of pulses that form the envelope shape.

74. (original): The laser apparatus as claimed in claim 66, wherein at one pulse further comprises a pedestal having sufficient energy to thermally heat the target area of the material.

75. (original): A laser apparatus for materials processing, wherein the laser apparatus applies bursts of laser light to a target area of a material at a predetermined repetition rate, the burst of laser light comprising at least first and second pulses of laser light overlapped in time, and wherein the first pulse emitted by the laser apparatus has a first pulse width and the second pulse emitted by the laser apparatus has a second pulse width, wherein predetermined parameters of the first pulse induce a change in a selected property of the material, and predetermined parameters of the second pulse interact with the property change induced by the first pulse.

76. (original): The laser apparatus as claimed in claim 75, wherein the predetermined repetition rate is substantially equal to or greater than 100 kilohertz.

77. (original): The laser apparatus as claimed in claim 75, wherein the predetermined parameters of the first pulse comprise pulse width, pulse energy, pulse wavelength and pulse

polarization vector and the predetermined parameters of the second pulse comprise pulse width, pulse energy, pulse wavelength and pulse polarization vector.

78. (original): The laser apparatus as claimed in claim 75, wherein the first pulse changes electronic properties of the processed material.

79. (original): The laser apparatus as claimed in claim 75, wherein the first pulse changes structural properties of the processed material.

80. (original): The laser apparatus as claimed in claim 75, wherein the first pulse creates a heat affected zone in the processed material and the second pulse ablates the heat affected zone.

81. (original): The laser apparatus as claimed in claim 75, wherein the first pulse has an envelope shape, wherein the first pulse is an aggregation of a plurality of pulses that form the envelope shape.

82. (original): The laser apparatus as claimed in claim 75, wherein the second pulse has an envelope shape, wherein the second pulse is an aggregation of a plurality of pulses that form the envelope shape.

83. (original): The laser apparatus as claimed in claim 75, wherein at one pulse further comprises a pedestal having sufficient energy to thermally heat the target area of the material.

84. (new): A method of machining a material, wherein the method comprises applying bursts of laser light to a target area of a material at a predetermined repetition rate, the burst of laser light comprising at least first and second pulses of laser light which overlap or are displaced

in time, wherein the first pulse has a first pulse width and the second pulse has a second pulse width, and the first pulse width is greater than the second pulse width, the first pulse creating no heat affected zone in the material.